

Application Number: 10/692,584  
Amendment Dated: February 14, 2006  
Reply to Office Action Dated: October 14, 2005

### **REMARKS**

This amendment is in response to the Office Action dated October 14, 2005, for which a three (3) month period of response was given. A Request for Continued Examination (RCE) and a one (1) month extension of time were filed on November 14, 2005. In conjunction with this filing, a one (1) month suspension of action period was requested under 37 C.F.R. § 1.103(c). On December 14, 2005, an additional two (2) month suspension of action period was requested. In light of the above, the Applicants, by and through their attorney, now respond as follows.

Since this response is being filed on February 14, 2006, the end of the suspension of action period under 37 C.F.R. §1.103(c), no extension of time is believed to be due. However, should an extension of time be due, or additional fees be necessary, the Commissioner is hereby authorized to charge any fees that may be due to Deposit Account No. 50-0959, Attorney Docket No. 089498.0447.

Claims 11 through 20 are pending in the application. Entry and consideration of this response and the enclosed Rule 1.132 Declaration by Dr. Mukerrem Cakmak is respectfully requested.

#### **I. The Present Invention:**

The present invention is directed to a process for controlling the strain hardening properties of a polymer. The process of the present invention includes blending a polymer with nanoparticles to produce a polymer composition, and then forming a film from the polymeric composition. The film formed from the polymeric composition is then subjected to strain hardening. As specified in the claims, the present invention permits a reduction in the true strain at which a polymeric composition undergoes strain hardening. In particular, the presence of nanoparticles in a polymeric composition, in accordance with the present invention, yields a reduction in the true strain at which the polymeric composition undergoes strain hardening.

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**II. Declaration by Dr. Mukerrem Cakmak:**

Enclosed herewith is a Rule 1.132 Declaration by the lead inventor, Dr. Mukerrem Cakmak. Dr. Cakmak has undertaken a review of Qian et al. (U.S. Patent No. 6,407,155), the art currently applied against pending claims 11 through 20.

As detailed therein, Dr. Cakmak analyzes the disclosure contained in Qian et al. with specific attention paid to the disclosure of Qian et al. as it relates to Figure 1 contained therein. Prior to reading the remarks contained herein, the Examiner's is respectfully requested to review the information contained in the attached Rule 1.132 Declaration.

**III. The 35 U.S.C. § 103(a) Rejection:**

Claims 11 through 20 have been rejected under 35 U.S.C. §103(a) as unpatentable over Qian et al. (U.S. Patent No. 6,407,155). Qian et al. is directed to methods for producing intercalated layered materials that are produced via the reaction of a layered material (e.g., a layered silicate material) with a coupling agent and co-intercalated with an onium ion spacing/compatibilizing agent and a melt processible oligomer or polymer by melt compounding. As discussed in Qian et al. at column 5, lines 14 through 18, the addition of nanoparticles to a layered material enhances the tensile, dimensional stability, ductility, gas-impermeability and elongation properties of a polymer matrix. The Examiner points to Figure 1 of Qian et al. as evidence that Qian et al. suggests and/or teaches a process for controlling the strain hardening properties of a polymer via the incorporation of nanoparticles in the polymer. Applicants respectfully disagree.

Based upon the definition of strain hardening included in Applicants' specification (see page 6, lines 12 through 13) and the information contained in the Rule 1.132 Declaration by lead inventor Mukerrem Cakmak, the disclosure contained in Figure 1 of Qian et al. does not support the conclusion that the polymer compositions disclosed in relation to Figure 1 of Qian et al. have undergone strain hardening. This is because, as explained in paragraph (6) of the attached Rule 1.132 Declaration by lead inventor Mukerrem Cakmak, the data presented in Figure 1 of Qian et al. is really "displacement:

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data. Accordingly, as detailed in paragraph (9)(a) the data contained in Figure 1 of Qian et al. is totally unrepresentative of strain hardening.

Given this fact, and the other facts detailed in the attached Rule 1.132 Declaration, one of ordinary skill in the art could not reach the conclusion that Qian et al. discloses, teaches or suggests a process for controlling the strain hardening properties of a polymer via the inclusion of nanoparticles. This is especially true in view of Example 8 of Qian et al. (column 24, lines 44 through 63), which unexpectedly yields a more ductile Nylon-6/nanoparticle composition when compared to pure Nylon-6.

Furthermore, one of ordinary skill in the art would not be motivated by the disclosure contained in Qian et al. to arrive at the process of the present invention. In light of this, the amount of nanoparticles used by Qian et al. is of no consequence to the present invention.

In response to the Examiner's statement that the data curves of the present invention are similar to those contained in Figure 1 of Qian et al., the Applicants respectfully disagree. This is because the data curves contained in Figures 1 through 10 are clearly different than those contained in Qian et al. since the data curves contained in the present application contain "sudden upturns" as defined in the specification of the present application (see page 6, lines 12 through 13 of the specification as filed). Such "sudden upturns" are clearly absent from the data curves of Qian et al., only downward turns are present in Figure 1 of Qian et al.

Thus, for at least the above reasons, Qian et al. fails to render obvious the present invention as recited in claims 11 through 20. As such, withdrawal of the obviousness rejection of claims 11 through 20 is believed due and is respectfully requested.

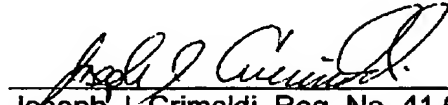
#### IV. Conclusion:

For the foregoing reasons, the obviousness rejection under 35 U.S.C. § 103(a) is believed to be unfounded. Accordingly, withdrawal of the pending rejection, and allowance of all of the pending claims is respectfully requested.

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Should the Examiner wish to discuss any of the foregoing in more detail, the undersigned attorney would welcome a telephone call.

Respectfully submitted,



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